

CLAIMS

What is claimed is:

1. A gas turbine engine combustor comprising:
 - an inboard wall;
 - an outboard wall; and
 - a forward bulkhead extending between the inboard and outboard walls and cooperating therewith to define a combustor interior volume,wherein, at least a first wall of said inboard and outboard walls comprises:
 - an exterior shell; and
 - an interior heat shield comprising a plurality of panels having:
 - an interior surface;
 - an exterior surface;
 - a perimeter having leading and trailing edges and first and second lateral edges;
 - a plurality of cooling gas passageways having inlets on the panel exterior surface and outlets on the panel interior surface; and
 - a rail, protruding from the exterior surface and recessed from the leading edge by 3-10 mm along a majority of the leading edge.
2. The combustor of claim 1 wherein the rail contacts the shell.
3. The combustor of claim 1 wherein the first wall is the outboard wall.
4. The combustor of claim 1 wherein the first wall is the outboard wall and wherein the inboard wall comprises:
 - an exterior shell; and
 - an interior heat shield comprising a plurality of panels having:
 - an interior surface;
 - an exterior surface;
 - a perimeter having leading and trailing edges and first and second lateral edges;
 - a plurality of cooling gas passageways having inlets on the panel exterior

surface and outlets on the panel interior surface; and
a rail, protruding from the exterior surface and recessed from the leading edge
by 3-10 mm along a majority of the leading edge.

5. The combustor of claim 1 wherein the shell has a plurality of apertures, positioned to direct cooling air against the panel exterior surface between the leading edge and the rail.

6. The combustor of claim 5 wherein the apertures are positioned to preferentially direct said cooling air along areas circumferentially aligned with fuel injectors.

7. The combustor of claim 1 wherein the rail is recessed along the entire front edge by at least 3.5 mm.

8. The combustor of claim 1 wherein there is a gap between the exterior surface and the shell having a height of 1-3 mm.

9. A gas turbine engine combustor comprising:

an inboard wall;

an outboard wall; and

a forward bulkhead extending the inboard and outboard walls and cooperating therewith to define a combustor interior volume,

wherein, at least a first wall of said inboard and outboard walls comprises:

an exterior shell; and

an interior heat shield comprising a plurality of panels having:

an interior surface;

an exterior surface;

a perimeter having leading and trailing edges and first and second lateral edges;

and

a plurality of pins protruding from the exterior surface toward the shell

wherein the shell has a plurality of holes for directing air to a space between the shell and heat shield and adapted for preferentially directing said air toward leading edge portions of first stage vanes of a turbine section.

10. The combustor of claim 9 wherein the plurality of holes comprises a plurality of alternating first and second groups of holes having at least partial differences in at least one of size and distribution.
11. The combustor of claim 9 wherein the plurality of pins contacts the shell.
12. The combustor of claim 9 wherein the plurality of pins is a continuous uninterrupted array.
13. The combustor of claim 9 wherein the plurality of pins a plurality of circumferential rows of pins, each row being out of phase with any adjacent row.
14. The combustor of claim 9 wherein the first wall is the outboard wall.